Propositional knowledge for conceptual understanding of statistics.

Stellingen behorende bij het proefschrift

Propositional manipulation for conceptual understanding of statistics

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1. Instructional guidance should decrease as students' prior knowledge increases. [*this thesis*]

2. Expert knowledge is a necessary but not sufficient condition to become an excellent teacher.

3. Although all social science research is qualitative in nature, qualitative methods can support but never replace quantitative methods.

4. The question is which instructional format works for whom and in which context rather than which instructional format is superior to all other formats. [*this thesis*]

5. Some formulas comprise more information than any picture or essay.

6. To minimize labor costs, companies massively employ a form of modern-day slavery called *unpaid internships*.

7. Given the hierarchical nature of the statistics knowledge domain, self-explanation and argumentation in combination with appropriate instructional guidance at each hierarchical level will provide the student with the necessary and sufficient conditions to develop expert knowledge. [*this thesis*]

8. If we continue to treat students as consumers rather than as individuals who need to meet essential criteria to obtain a degree, diplomas will continue losing their value.

9. In almost all educational research settings, randomized experiments are feasible and should be preferred over quasi-experimental or observational designs.

10. The *expertise reversal effect* has important implications for statistics education; curriculum developers and teachers should inform themselves about these implications and present their learning materials accordingly. [*this thesis*]